



DEPARTMENT OF NATURAL RESOURCES  
WATER PROTECTION PROGRAM  
WATER QUALITY MONITORING AND ASSESSMENT SECTION  
WATERSHED INFORMATION SHEET

## Eleven Point River Basin-11010011

### Basin Description

This basin lies in south-central Missouri and north-central Arkansas and consists of all the land drained by the Eleven Point River and its tributaries. The basin covers approximately 1,207 square miles, eighty-five percent of which is in Missouri. The main tributaries of the Eleven Point River in Missouri are Frederick Creek, of which Piney Creek is a tributary, Hurricane Creek, Spring Creek, and Middle Fork. There are no major lakes in the basin, and no surface sources of drinking water. Average annual precipitation in the basin is 44-49 inches. Streamflow statistics for the basin are shown in Table 1.

Table 1. Stream Flow Statistics for Eleven Point River Basin

Stream/Location	Watershed Area (sq.mi.)	Period Of Record	Flow (cfs)			
			90 <sup>th</sup> Percentile*	Median**	10 <sup>th</sup> Percentile***	7Q10 Low Flow+
Blue Spring nr. Alton	--	1925, 1932-6, 1942, 1964, 1966-7, 1971	--	--	--	50
Boze Mill Spring nr. Bardley	--	1925, 1931-4, 1936, 1964, 1966-7	--	--	--	12
Eleven Point R. nr. Bardley	793	1922-2004	1,410	550	264	185
Eleven Point R. nr. Mountain View	--	1964-6	--	--	--	0
Eleven Point River at Thomasville	--	1942-3, 1945-6, 1951, 1962-7	--	--	--	0
Eleven Point River near Thomasville	--	1951-72	--	--	--	4.1
Frederick Cr. nr. Myrtle	--	1969-71	--	--	--	0
Greer Spring at Greer	2.97	1921-2004	545	322	170	122
Morgan Spring nr. Alton	--	1925, 1932-6, 1942, 1964, 1966-7, 1971	--	--	--	16
Turner Mill Spring nr. Alton	--	1924-5, 1932, 1936, 1964-5	--	--	--	1.7
Spring Cr. nr. Thomasville		1969-70				0

\* Flow is less than this amount 90 percent of the time

\*\*Flow is less than this amount 50 percent of the time

\*\*\*Flow is less than this amount 10 percent of the time

+ The lowest average 7 consecutive day flow that occurs with a recurrence interval of 10 years.

Forest and woodland dominate the Eleven Point basin, accounting for sixty-seven percent of land use in the Missouri portion. Pasture and grassland cover thirty-three percent of that portion, with other uses covering very small areas.

The Eleven Point River basin lies within the Ozark Plateau physiographic province. There are some areas of relatively flat upland plain, but most of the basin is hilly, and the terrain generally grows rougher near larger rivers and streams. The hills are most rugged in the Eleven Point River valley in northeast Oregon County. Most of the basin lies in Ordovician dolomites and sandstones, but the deepest valleys incise Cambrian dolomite. All of these carbonate rock formations are soluble, some to a very great degree. This leads to a great deal of groundwater movement and creates many karst features, such as losing streams, sinkholes, caves, and large springs. There are 138 known springs in the Missouri portion of the basin. The springs with mean flows of over 1 cubic foot per second (cfs) are listed in Table 2. Dye trace experiments have shown that water entering the subsurface in the areas of Hurricane Creek, Spring Creek, the Eleven Point River, and even Middle Fork can travel far to the east and emerge in Big Spring on the Current River, the largest spring in Missouri.

Table 2. Major Springs in the Eleven Point River Basin

Spring Name	County	Mean Flow (cfs)
Greer Spring	Oregon	289
Blue Spring	Oregon	72
Boze Mill Spring	Oregon	23
Dennig Spring (lower)	Oregon	10.42
Blue Hole Spring	Oregon	7.74
Sullivan Spring	Oregon	5.94
Dennig Spring (upper)	Oregon	2.86
Turners Spring	Oregon	2.3
Posy Spring	Oregon	1.89

Water Quality of Missouri Springs

<http://www.dnr.mo.gov/env/wpp/watersheds/info/wq-missouri-springs.pdf>

## Water Quality Concerns

Acceptable water quality is defined by Missouri's Water Quality Standards

[<http://www.sos.mo.gov/adrules/csr/current/10csr/10c20-7a.pdf>] . Streams or lakes that do not meet these standards are considered "impaired." They may not be fit for certain uses, such as swimming, drinking water supply, or protection of fish and other aquatic life. Waters are considered to be "affected" rather than "impaired" if water quality changes are less serious and state standards are not exceeded. These standards also list more than 3,600 classified streams and more than 400 classified lakes in the state. A classified stream is one that is either a permanently flowing stream or one that may stop

flowing in dry weather but still maintains large pools of water that support aquatic life. Unclassified streams are the small tributaries to classified streams that do not typically maintain pools capable of supporting aquatic life for the entire year.

### **Point Source Pollution**

Point source pollution is a discharge of wastewater from a single location such as a wastewater treatment plant. Wastewater treatment plants can serve industries, small businesses, subdivisions, mobile home parks, apartment complexes, or entire cities. Wastewater from residential sources such as subdivisions, apartments and mobile home parks is often referred to as “domestic wastewater.” It contains primarily treated human wastes, food wastes and detergents. The primary pollutants of concern in domestic wastewater are the amount of organic matter, which is commonly reported as biological oxygen demand (BOD), suspended solids, and ammonia. Industrial and commercial wastewater can be more complex and may contain, in addition to domestic wastes, heavy metals or man-made organic chemicals that can be potentially toxic. Discharges from most municipal wastewater treatment plants are usually a mixture of domestic and industrial/commercial wastewater. Most wastewater plant discharges are also typically high in nitrogen and phosphorus. These two elements act as fertilizers and can cause excessive algae growth in waters receiving these discharges.

There are currently three permitted point sources in the Eleven Point basin. These are the municipal wastewater treatment plants of the towns of Willow Springs, Birch Tree, and Alton. They discharge a combined volume of 0.42 million gallons per day (mgd). There are approximately 170.5 miles of classified streams in the basin, none of which are known to be impaired by point sources. 0.3 miles of classified stream are considered affected by point sources, as well as 0.6 miles of unclassified stream that is considered affected by the Birch Tree WWTP.

### **Nonpoint Source Pollution**

Nonpoint source pollution occurs when pollutants enter bodies of water at many locations over a wide area rather than at specific, well-defined points. Examples include the erosion of sediments or the entrance of polluted surface runoff or groundwater into lakes and streams. Locations of nonpoint source pollution are often widely dispersed and are difficult to identify or control.

Given the extremely porous nature of the bedrock in the Eleven Point basin, the potential exists for rapid contamination of groundwater. New wells should be sealed from the surface down to solid bedrock and abandoned wells should be plugged to prevent contaminated surface water from flowing down the wells. However, there are few of the threats to groundwater quality in the Eleven Point basin that may be encountered in some parts of the state, such as agricultural runoff, urban storm water runoff, or leakage from faulty septic tanks.

Exploratory drilling for lead has taken place in recent decades in an area around McCormack Creek between Hurricane Creek and the Eleven Point River. No actual lead

mining ever took place, however, and it is not believed that the exploratory drilling had a significant impact on the quality of groundwater.

The Eleven Point River has been placed on Missouri's list of impaired waters due to the levels of mercury that have been found in fish. Mercury is not a direct threat to water quality, but it can accumulate enough in larger fish for it to be a concern for human consumption. The mercury found in the fish of the Eleven Point River and other Missouri waters is presumed to be primarily of airborne origin. Mercury can travel very long distances in the air, and therefore the sources causing the contamination can be extremely difficult to identify and control.

#### Wastewater Treatment

<http://www.dnr.mo.gov/env/wpp/watersheds/info/wastewater-treatment.pdf>

### **Water Quality Management**

The department achieves water quality management of point source pollutants through the issuance and enforcement of wastewater discharge permits. These permits limit the amount of pollutants that can be discharged. All point source wastewater dischargers must obtain a permit and adhere to its discharge limitations. All permits require a level of treatment at least equal to national wastewater treatment standards. In situations where these national treatment standards are not adequate to protect the streams or lakes receiving wastewater discharges, stricter permit limits that do protect these waters are required. The department requires dischargers to conduct regular monitoring of discharge quality and report their results. The department also conducts regular inspections of wastewater treatment facilities and receiving waters.

Nonpoint source pollution is addressed through the state's nonpoint source management plan. This plan is a cooperative project between the Missouri Department of Natural Resources and many other federal, state, and local government agencies, organizations, local landowners, and other interested citizens. The plan emphasizes addressing problems at the watershed level through the use of management practices that control nonpoint source pollution. The most commonly supported practices are those that control soil erosion on tilled land, improve quality and quantity of forage on grazing lands, protect riparian zones, and control runoff of animal manure, fertilizers, and pesticides. The state nonpoint source management plan is a voluntary program that provides grants to help defray the cost of adopting improved management practices. No nonpoint source watershed management projects have yet taken place in this basin.

The Total Maximum Daily Load (TMDL) is a calculation of how much of a certain pollutant may enter a certain waterbody without violating water quality standards, and of limits for the discharge of that chemical by specific sources. A TMDL for chlorine in Piney Creek was completed in 2001. The Eleven Point River has been designated to have a TMDL written for mercury in fish, but a target year has not yet been set.

The Missouri Department of Natural Resources monitors water chemistry and aquatic invertebrate communities at many locations in Missouri. The department also tracks the quality of domestic, industrial and storm water discharges. These monitoring activities provide information on water quality problems, such as their specific location, pollutants, sources and possible solutions. This information guides the management activities the department takes to protect water quality in Missouri.

**For more information you can visit the following web sites:**

**TMDL Fact Sheet**

<http://www.dnr.state.mo.us/oac/pub2090.pdf>

<http://www.dnr.state.mo.us/env/wpp/tmdl/wpc-tmdl-EPA-Appr-date.htm>

**United States Geological Survey, Water Resources of Missouri**

<http://mo.water.usgs.gov/>

**Missouri Department of Conservation**

<http://www.conservation.state.mo.us/fish/watershed/elevenpt/contents/090cotxt.htm>

**United States Army Corps of Engineers, Little Rock District**

<http://www.swl.usace.army.mil/>